

## **ABSTRACT**

Microfluidic devices for manipulating relatively dense materials, such as colloidal rod particles, are provided. Microfluidic devices for separating a denser first material from a less-dense second material are provided. Methods of manipulating a relatively dense first material, for example, colloidal rod particles, and separating the first material from a less-dense second material, are provided. Methods of marking samples or sample components with relatively dense materials, are also provided.